

Patent Abstracts of Japan

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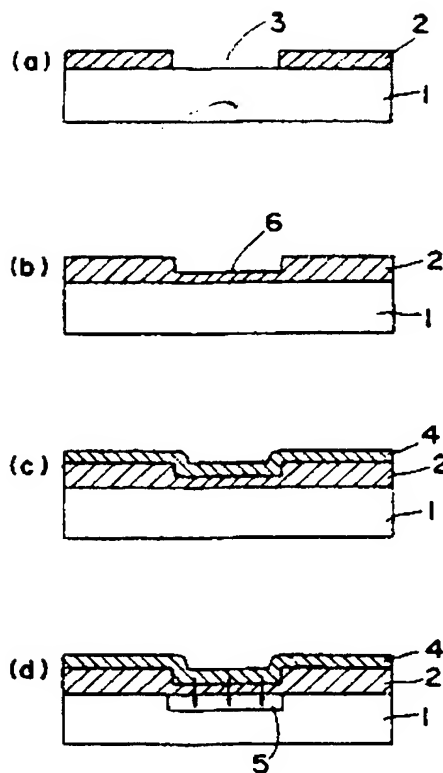
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TITLE : MANUFACTURE OF  
SEMICONDUCTOR DEVICE



ABSTRACT : PURPOSE: To form a diffused layer having high density and few defects under a lower temperature and in a shorter time compared with those in the non- additive case by adding a small amount of HCl in diffusion based on a doped oxide method using a buffer film of an oxide film during heat treatment.

CONSTITUTION: As a semiconductor substrate, for example, a thermal oxide film 2 is grown by approximate  $10,000\text{\AA}$  on a P type (boron doped) silicon substrate 1. A window is formed on the thermal oxide film 2 to provide an opening 3. Next, a thermal oxide film 6 of the thickness of approximate  $800\text{\AA}$  is formed on the silicon substrate 1 in the atmosphere of  $\text{We}+\text{O}_2$  at  $750^\circ\text{C}$ . At this time, the thickness of the oxide film 2 which has been already grown up to that of  $10,000\text{\AA}$  hardly varies. Next, PSG (phosphorous glass) 4 of the thickness of  $4,000\text{\AA}$  is made to grow on the surface of the silicon substrate 1 by a normal temperature CVD device. In this time, the growth condition is assumed to be 8,000PPM at  $410^\circ\text{C}$ ,  $\text{PH}_3$  of 2.4l/min,  $\text{SiH}_4$  of 0.8l/min and  $\text{O}_2$  of 1.4l/min. Next, when this glass is heat-treated for an hour in the  $\text{O}_2$  atmosphere and under a partial pressure 1.5% of HCl, phosphorous is diffused on the silicon substrate 1 via a buffer film of the oxide film 2 from the PSG 4 to allow a high density diffused layer 5 to be obtained.

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